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Trees in October.

THIS year the beauty of the autumn landscape has been enhanced by the delaying of severe frosts and by a succession of windless days, which gives the final touch of perfection, like the bloom on a fruit, to the rich color which enwraps the woodlands. Though chilly nights have done their work, the days of early October were replete with sunshine and the temperature has been perfect, as if nature wished to aid the rejoicings of the Columbian year, and to that end had hung out her banners in more dazzling splendor than ever. Perhaps the dryness of the season has prevented the best development of the leaves, and in some cases marred their beauty. The absence of high winds, however, has kept the trees in foliage beyond the usual time, and made the outdoor enjoyment of them continually possible. To the tramping myriads in New York these days have been a priceless boon, as well as to the throngs of spectators who watched for hours the great processions on the natal day of the New World.

If a June day in New England is perfection, as the poet sings, that "rareness" is rivaled by these October days when earth and sky and air are once more attuned to perfect harmony, and the funeral pyre of the dying summer is robed with purple gold and flames with crimson and yellow fire. The variations of tint in even a small group of trees are wonderful. The scarlet of the Swamp Maple is relieved against the claret and bronze of the Ash; the bright chrome of the Beech melts into orange shading into red of the Rock Maple; the Oak, with its amber-bronze flushed with crimson, forms the deepest tone in this scale of color which is here and there relieved by the green of some slowly fading deciduous tree or the rich dark foliage of the Pines and Hemlocks. Upon the hills the Chestnuts turn to amber, the Scotch Larches hold aloft their tasseled branches of tawny gold, so that the frost-touched Hickories, shriveled and brown, look dull beside them, while the dark blue Cedars stand up stiff and tall unchanged as yet by the cold.

Physiological botanists tell us that the kindling color in autumn leaves is due to the breaking up of the chlorophyll pigments into xanthophyll and erythrophyll, but if the man of science pursues the subject much beyond the giving of names to substances of whose composition he knows little, he soon reaches the absolute limit of his knowledge in this direction. We know that in our New England states these colors are much more brilliant than they are on the other side of the Atlantic, and our trees when transplanted to the gardens of Europe lose much of their autumn glory. It is supposed that our less humid climate in some measure accounts for the difference, and we know that the autumn coloring of the woods in a cool moist season, when lusty growth continues until freezing weather, is not so rich as it is in those years when the autumn air is drier and the sunshine brighter. Frost may hurry or modify this process of changing color, but it is not essential, certainly, because leaves often turn long before the frost appears. Thoreau says that color stands for all ripeness and that leaves before they fall acquire these bright tints just as fruits do when they mature. This is poetical analogy, however, and not science, for it is found that the changes in these two cases are caused by entirely different processes in the subtle chemistry of life.

But, whatever the causes of this marvelous change or however its processes are carried on, no one can look unmoved upon the splendid pageant. Our eyes never become weary of it, and every year it is witnessed with renewed wonder and delight. Individual trees and small groups of trees are strikingly beautiful in their way, but they cannot compare in magnificence with a great stretch of forest when it can be seen from above or when it sweeps up some broad mountain slope. Perhaps this is an insignificant point to be considered by those who wish to preserve our forests, and yet, if our woodlands are swept away in great breadths, the country would be robbed of a distinct feature of its autumn attractiveness. We should think lightly of Venice if she were ready to give over to the destroyer her acres of canvas rich with color and splendid in design. Certainly that man lacks patriotic pride who can see unmoved the destruction of miles of forest which every autumn paints in colors which would drive Titian and Veronese to despair if they should ever attempt to emulate them with brush and palette.

We have heretofore noticed the fact that individual trees of the same species often show marked differences in their autumn coloring. Close observation shows that these characters are persistent—that is, if the leaves of a certain Oak are more brilliant than those of any of its associates this year, they will continue so year after year. The general display may vary with the season, and, as a whole, it may be more or less brilliant, but these individuals always stand distinctly out from the others in effects of color. It is also true that sometimes the leaves on a single Maple-branch will turn scarlet, while the remainder of the tree is green, and it will do the same thing next year, and the next. Gardeners have perpetuated peculiarities of this sort with trees of abnormal color like the Purple Beech, or unusual habit of growth, like the Pyramidal Oak. Is it not a promising field of experiment to select certain trees with reference to the quality of their autumnal tints and secure a race of Maples or Oaks or Elms of unusual brilliancy? It might be found that the stock on which these cions were grafted would influence their coloring. It might be discovered that the peculiar brilliancy of individual trees is due to some chemical quality of the soil in which their roots feed. These certainly are matters which ought not to be left to conjecture. In the interest both of science and of art, the subject is worth investigation by our experiment stations, and there may be enterprising nurserymen who are willing to put the matter to practical test as a business venture.

A MEMBER of the well-known horticultural firm of Dammann & Company, near Naples, recently contributed to *Gartenflora* an interesting article on certain plants which, for centuries, have been called "Jericho Roses." These are natives of the deserts of Palestine, which, in ancient times, were thought to possess magical powers, because when they had long been in a desiccated condition they would at once expand and seemingly revive if immersed in water. Many specimens were brought home by the Crusaders, and so highly were they prized, for semi-religious reasons, that they were often represented in the paintings on old shields which still exist in France.

One of these plants, says the writer from whom we quote, is Anastatica hierochuntica of Linnæus, which belongs to the Cruciferæ, and its name comes from the Greek anastasis, meaning "Resurrection." It was introduced into European cultivation in the year 1597, but the evidence of old armorial paintings shows that it was known, in imported specimens, at a very much earlier day, while ancient records tell that, in the time of the Crusades, a person who possessed such a specimen won wide distinction from the fact. "Drawn by the hot sun shining on the white sands of the desert," says our author, "into tight blanched balls, the dry twigs expand when placed in water just as a sponge does, or, indeed, any other desiccated plant. When again dried, the twigs contract once more, and this process may be often repeated during a period of several years. About a quarter of an hour is required for the unfolding, and the plant must be completely immersed, preferably in warm water." This "Jericho Rose," which, however, we are told is not the "true" one, is the only known species of its genus, but is most nearly related to our Arabis and Cardamine. Never attaining a height of more than eight centimetres, it spreads so widely that it sometimes forms a considerable bush, with a deep tap-root, furnished with but few rootlets, which eventually assumes a woody consistency. The outermost ones of its many stiff twigs curve inward, so that a characteristically developed specimen looks like a solid ball cut in two horizontally, and presenting a perfectly flat upper surface. The small white flowers are scarcely visible, and are usually deeply imbedded in the densely packed and somewhat fleshy foliage. The writer says that though this plant is reputed very difficult to cultivate, he has succeeded in raising specimens nearly half a metre in diameter, which look like smooth little green carpets.

The "true Jericho Rose," however, is Astericus pygmæus (formerly known as Odontospermum pygmæum, Neck.), which belongs to the Composite family. Although described by botanists only in recent times, it is, like the Anastatica, very faithfully pictured on old French crusading shields. Its name, of course, like that of our Asters, was inspired by the starry form of its blossoms. When dried, it has an absolutely dead and wooden appearance, but if placed in tepid water it expands entirely in the brief space of one minute, so that, in more superstitious ages than ours, it was very naturally accredited with non-natural powers. This Jericho Rose grows in the Canary Islands, in Africa and in Arabia, but with especial frequency in the deserts near the Suez Canal, whence, in a dried condition it is brought by the Bedouins to the bazaars of Jerusalem and the other cities of the Holy Land.

A picture of this Astericus, published with the article in *Gartenflora*, shows an apparently leafless plant, bearing, at the ends of stout flower-stems, a number of rather large fleshy star-shaped heads forming a flattened group around a larger central head, the arrangement recalling that of the familiar Stone-crop, which our children call "Hen and Chickens." Specimens may be obtained, our author informs us, from Herr George Eggers, of Joppa.

FOUR-SCORE years have not sufficed to chill the enthusiasm or curb the enterprise of the veteran Robert Douglas, who has been making a trip on horseback over the Siskiyou Mountains to visit the famous Weeping Spruce (Picea Breweriana). In a private letter he writes of this tree that, "to appreciate its appearance one must imagine a Norway Spruce from a hundred to a hundred and thirty feet high and three feet in diameter breast-high, with branchlets set thick together along each branch and hanging straight down sometimes to a length of six feet, although no larger than a lead-pencil at the point where they leave the limb." From a small twig which he kindly sent the foliage seems to be better than that of the Norway Spruce, not so long, but wider and thicker, and of a lighter and more cheerful green. The cones before they open are about as large as a man's middle finger. The seeds are small, although a trifle larger than those of the White Spruce, and Mr. Douglas estimates about 50,000 seeds to the pound. Several persons have tried to collect these seeds, but, so far as we know, Mr. Douglas was the first one to gather them, at least in any quantity. The trees stand on the steep mountain-side, and the cones are all on the very topmost branches of the tree and more than a hundred feet from the ground. In prospecting about this vicinity Mr. Douglas found a few trees that had not been discovered, so that in this station there are about a hundred full-grown trees. Standing where the snow lies over more than one-half of the year, and where the cold is very severe, they should be able to endure the severest eastern winters, although it is doubtful whether they would stand in a very dry atmosphere.

Notes of a Summer Journey in Europe.—XVI.

WITHIN a few years there has been a good deal of controversy in some foreign journals regarding the value of schools of horticulture and agriculture, and it is a subject of constant discussion among gardeners and farmers as individuals. Among a large class the idea seems to prevail that such institutions are of little value, that the teaching is theoretical rather than practical, and that graduates from these establishments are really less efficient and less valuable than men who have been working gardeners and farmers from their youth, and who have never been troubled by scientific considerations in their occupations. Another argument used against the school-training has been that the openings for specially trained men are extremely few, and that a graduate of a horticultural school has less chance of obtaining a good situation as gardener, at a satisfactory salary, than the man who never heard a lecture on botany, vegetable physiology or entomology, and who, moreover, would be willing to work for lower wages. But the old adage, "Knowledge is power," seems to hold here as in other occupations, and we find that natives of Germany, France, Belgium and other countries famous for their horticultural schools, are, in the majority of cases, to be found taking leading positions in matters relating to horticulture in almost every country in the world. It is true that two or three years of training in a school cannot produce a mature gardener, thoroughly experienced in all branches of his craft, but a good training will lay the best possible foundation for the acquirement of knowledge and the highest use of it.

One of the best of the French schools of horticulture is that at Versailles, being an institution founded and maintained by the Government. The grounds of the school were formerly, for about two hundred years, used as a sort of royal kitchen-garden, being laid out under the reign of Louis XIV. at a cost, we are told, of nearly a quarter of a million dollars. The total area is twenty-three or twenty-four acres. It is now about eighteen years since its foundation as a national school of horticulture, and already the records show valuable and interesting results in the number of pupils who have graduated as practical gardeners, and the responsible positions many of these graduates have taken in various horticultural and botanical establishments. About six hundred students have already received the benefit of a course of instruction here. The school is freely open to any one between seventeen and twenty-one years of age who can pass a satisfactory examination in the four ordinary studies of the common schools.

The course of instruction is completed in three years, and includes a general knowledge of botany, zöology, economic entomology, chemistry, geology and drawing, besides the subjects generally considered as pertaining to practical horticulture. If a student passes a satisfactory examination at the end of his course he receives a certificate from the Minister of Agriculture. Vacations are short, and the students perform

all the manual labor, in every detail, in the gardens and grounds, so that they get a thoroughly practical training as well as the knowledge derived from lectures and books. At the time of my visit, in early September, it was plainly to be seen that the practical part is done in a thorough manner, for, although many of the students were away on furlough, I found the place in fine condition, neat and free from weeds, the plants showing the result of good cultivation and care. The whole establishment is divided into neat beds and squares devoted to particular purposes, and there is also a considerable area covered by glass houses and frames.

In growing fruit-trees the artificial espalier system, so general in French gardens, is almost entirely resorted to; the plants grown are also very largely dwarfs. The system is one very rarely practiced among such fruits as Pears and Apples in our own country, but fruit of a very fine quality can be raised in this way. The small area of the school-grounds necessitates some such practice, because if normal trees were grown there would be space for but a very limited variety, and, moreover, the natural system would not suit the prevailing demand and necessity. It is stated that there are about twelve hundred varieties of fruit-trees and fruiting-shrubs grown in this garden. Of these nearly one-half are pears. This fruit has been so much cultivated and improved by Frenchmen that one almost regards pears as the national fruit of France, as the Fleur-de-lis is the national flower. There are more than three hundred varieties of Apples; of Peaches there are about a hundred and twenty-five varieties, while Apricots, Cherries, Grapes and other fruits are well represented.

A small piece of ground is used as an arboretum or collection of ornamental, shade and forest trees, and a good number of specimens have been accumulated. But the area available is so small that the plants hardly have nursery-space and are very much crowded, yet the collection may serve a useful purpose in assisting pupils to become acquainted with and to identify the various species and varieties, of most of which fine, well-developed individual specimens may be studied in parks and collections at other places in the vicinity of Paris.

In flowers this garden is probably most famous for its Roses, which were somewhat of a specialty with Monsieur Hardy, the late director, who did so much for the advancement of the school. His name and his father's name are commemorated in a most curious little single-flowered Rose, which is said to have originated in the Luxembourg garden more than half a century ago, by natural hybridization between Rosa clinophylla, a white-flowered Indian species, and the curious yellow-blossomed, simple-leafed Rosa simplicifolia from Persia and countries north and east of it. This odd little hybrid is known as R. Hardyi. As seen growing in the vicinity of Paris it seemed so dwarf and slender as to almost appear herbaceous, and its habit reminded me more of our little R. foliolosa than any other species. The stems of R. Hardyi are armed with a few stout straight spines; there are from five to seven small dark green leaflets to each leaf; and the flowers are about the size of those of R. foliolosa, but instead of being produced solitarily there are several on the end of each shoot. The petals are light or sulphur-yellow colored, the color deepening slightly from the tip toward the base; while the base of each petal, for nearly a fifth of its length, is of a dark crimson color. This Rose seems to bloom freely, and I saw it in blossom at Paris in the middle of July and again in early September. It is not likely that it would be hardy in our northern or New England states and I do not know that it has been tried here.

The greenhouses and forcing-houses are simple in construction but well calculated to serve the purposes intended. Nearly two hundred years ago, when it served as a pleasure and pastime for the King, this garden was famous for the early forcing of fruits and vegetables, but since then it is easy to imagine the great strides which have been made in improvement of methods and in the qualities of varieties.

The buildings used as class-rooms and for similar purposes are very simple in construction and arrangement and unpretentious in appearance. They contain a herbarium for constant reference; herbarium specimens which show the character of the injuries caused by particular kinds of insects and fungi; collections of beneficial and injurious quadrupeds, birds and insects; a very large number of excellent models of fruits; examples of seeds and other subjects of an instructive character. A well-selected series of woods of trees shows the character and appearance of important species when cut and finished in several different ways, while sections with the bark attached are intended to be helpful in the recognition of trees from the outward appearance of the stems. Altogether, the school seems admirably well fitted and conducted to carry out the objects for which it was established. To fulfill the requirements here a student must work not only with his mind in the acquisition of knowledge from lectures and books, but he must share, and intelligently perform under competent direction, the manual labor and management of the whole establishment, for, as already stated, no ordinary laborers whatever are employed.

The surplus products of the school in the way of flowers, fruits, vegetables or plants are sold to the public, and the income thus derived forms no inconsiderable item to the state toward defraying the expenses of the establishment. Prizes in cash amounting to nearly two hundred and fifty dollars each are awarded by the Minister of Agriculture to those students who graduate with the highest honors, and it is generally expected that this sum will be spent in furthering their studies in some horticultural centres, as in the Netherlands or England.

The institution would, no doubt, be greatly benefited and its practical value increased by the possession of larger grounds for experimentation and work. This may come in time. Meanwhile the students are abundantly supplied with interesting examples and object-lessons in the gardens and nurseries which are so abundant in the country about Versailles.

Arnold Arboretum. *J. G. Jack.*

The Mountain Flora of Alabama.

THE following paper was read by Dr. Charles Mohr, of Mobile, Alabama, before the Botanical Club at the meeting of the American Association for the Advancement of Science at Rochester last August.

The investigation of the flora of the Appalachian Mountains of the southern states has been chiefly carried on in the central and most elevated parts of the mountain-chain. Little has been made known of the floral conditions existing in its extreme southern outliers, which in relation to the distribution of plants in the eastern part of this continent are invested with a peculiar interest. Many plants, chiefly at home in high northern latitudes, follow the summits of the mountains into the warmer temperate zone and find upon these spurs the limit to their southward progress, while a number of others are confined exclusively to a single locality, or less frequently to several isolated localities.

The following remarks on the mountain flora of Alabama are based on observations made during the earlier part of this season in the mountainous region bordering upon the Tennessee Valley, on Lookout Mountain, near the north-eastern corner of the state, on the extensive table-land of the Warrior coalfield, with its steep escarpment forming the southern border of the Valley of the Tennessee, and on the detached outliers of the Cumberland Mountains, which form its north-eastern border. The region corresponding in the character of its flora with the flora of the higher mountain region of the adjoining states of Georgia, North Carolina and south-eastern Tennessee is in Alabama entered at an altitude not exceeding 2,000 feet above the sea. In the Lookout Mountain region this is indicated by a Rhododendron proper, R. maximum, the frequency of various other Rhodoraceous Ericaceæ, Vacciniums and several species of Ilex. This region is further characterized by the large preponderancy of deciduous-leaved trees, the almost entire absence of Magnolias and of coniferous trees in general, particularly of Pines of a decided southern range.

The somewhat abrupt declivity of Lookout Mountain, rising to a height of from 800 to 900 feet above Little Wells Valley, is covered with a tall forest, chiefly of Oaks, the species of the White Oak group prevailing. But a short time ago, it was noted for the abundance of fine timber of White Oak (Quercus alba), and for the tan-bark derived from the Mountain Oak (Q. Prinus), but these resources are at present almost exhausted. The Black Locust has in these forests been for the first time recognized as a truly indigenous tree in Alabama. In the deep shade of the high forest on these declivities, several tall umbelliferous plants strike the attention of the observer, among them being Ligusticum actiæfolium, Angelica hirsuta, Thaspium pinnatifidum, with Pimpinella integrifolia and Zizia serrata smaller in size. Oxalis recurva and Polygonatum giganteum are for the first time noted within the limits of the southern flora associated with Anemone nemorosa, var. quinquefolia, Stellaria pubera, Galium latifolium, Asclepias quadrifolia, Trillium erythrocarpum, Disporum lanuginosum, Uvularia grandiflora and U. perfoliata. Emerging from the high forest at the base of the cliffs of the lower carboniferous sandstone, which border the brow of the escarpment, the southern Philadelphus hirsutus, Ilex Monticola, Viburnum dentatum, V. acerfolium, Rubus occidentalis, R. Canadensis and Celas-

trus scandens frequent the sunny heights. On the rocky flats of the table-land, where neither shrub nor tree is able to gain a foothold, Arenaria brevitolia, Talinum teretifolium, Sedum ternatum, and Opuntia Rafinesquii fill every hollow and crevice. Senecio aureus, var. Balsamitæ, frequent on the borders of wood-lands, becomes by its abundance a troublesome weed in the pastures and fields. Rubus strigosus covers low grassy banks. The forests on the plateaus of Lookout Mountain are open, the Mountain Oak frequently prevailing with Scarlet Oak. Post Oak (Quercus minor) and Black Jack (Q. nigra), Chestnut and Hickories are less frequently met with, and the Scrub Pine, Pinus Virginiensis, the only one of its kind found in this part of Lookout Mountain, is seen in greatest perfection in detached groups. The springy soil in the gentle depressions of the table-land is covered by a most luxuriant growth of beautiful shrubs, and these also shade the rocky banks of the water-courses. In the first of these situations abound Rhododendron arborescens, R. nudiflorum, R. viscosum, Calycanthus floridus, Ilex Monticola, Vaccinium virgatum, and a peculiar form of V. stamineum, three to four feet in height, and, on account of its large edible berries, known by the settlers as the Wild Gooseberry, while the rocky banks of the creeks are preferred by Rhododendron maximum, Kalmia latifolia, Calycanthus glaucus and by Viburnum cassinoides. This shrub from the Saskatchewan Valley and the north of New England, extending to the sunny hills of Alabama, overshadows on the banks of Little or De Soto River the Sarracenias and Eriocaulons common in the lower south, such as Sarracenia flava, Eriocaulon gnaphalodes, and Lachnocaulon Michauxii, which have established themselves on the grass and sedge covered sands thrown up on the banks of the stream. Diervilla sessilifolia is frequent on the rocky hill-sides of the narrow valleys, with Coreopsis verticillata, Bigelovia nudata, var. virgata, Galax aphylla, Thalictrum clavatum, Viola rostrata and V. striata on the rocky shaded banks moistened by never-ceasing rivulets. Thalictrum dioicum, Asarum Virginianum and Saxifraga Virginiensis prefer rocky ledges and hill-sides covered by a drier soil with Deschampsia flexuosa, Festuca nutans, Danthonia compressa, Eatonia Pennsylvanica and E. Dudleyi. Asplenium Bradleyi, sparsely scattered throughout the Cumberland Mountains of Tennessee and southern Kentucky, has been found on the damp base of deeply shaded rocks. Asplenium pinnatifidum, A. montanum, A. Ruta-muraria and Cheilanthes vestitata prefer exposed cliffs, and Adiantum pedatum, Aspidium marginale, Dicksonia punctilobula, Cystopteris fragilis love shaded ravines.

Of the sixty-two species of vascular plants, outside of the forest-trees common everywhere, observed in this higher mountain-region, thirty-five, or fifty-six per cent., are most frequently distributed in the northern states; fourteen species, or twenty-three per cent., have a pronounced southern distribution, and twelve species, or little less than twenty per cent., are typical southern plants.

Descending from the higher mountain region to the table-lands and ranges capped by the conglomerates of the coal-measures, not exceeding in their average elevation 750 feet above the sea, the character of the vegetation changes with the frequent appearance of evergreen conifers among the deciduous-leaved trees of the forest. The Short-leaf Pine (P. echinata) crowns the ridges of a meagre and dry soil, and the Loblolly Pine covers the damp depressions, devoid of drainage, of the table-land; upon these swales, from a fraction of an acre to several in extent, this tree arrives at the best of its development and furnishes the greater part of the lumber-supplies drawn from this region. The Scrub Pine is here rarely seen, and the Mountain Oak much less frequently met with, while the Black Oak (Quercus tinctoria), Spanish Oak, Post Oak, Scarlet Oak, with the Chestnut and Mockernut Hickory, prevail in the closer soils of the table-land. Oaks of semi-persistent foliage, like Q. uliginosa and Q. Phellos, make their appearance in the coves and along the banks of streams; Magnolias take a prominent place in the forests of the elevated valleys beside the Black Sugar Maple, Ohio Buckeyes, huge Poplars, White Ash and White Oak. In a valley with such a tree-covering on Sand Mountain, near the western border of this region in Alabama, was Magnolia cordata discovered in 1880; a tree with characters but little understood before that time and its distribution involved in obscurity. From the Alabama specimen, it was evident that it was wanting in specific characters to separate it from M. acuminata, and it was hence admitted by Professor Sargent as M. acuminata, var. cordata, in the *Silva of North America*. On the rocky banks of the middle fork of Sipsey River, a tributary of the Warrior River, in connection with the valley in which the yellow-flowered Magnolia finds its secluded home, are found groves of stately Hemlocks along the course of the creek to its junction with the main stream for a distance of from twelve to fifteen miles, where this tree reaches its southern limit. It is remarkable to find on this, its extreme and perfectly isolated outpost, the Hemlock associated with the Cherry Birch (Betula lenta), one of its companions in its northernmost home. Of trees of smaller size are to be mentioned Oxydendrum arboreum and Halesia tetraptera; of shrubs, the Azaleas, common in the higher region, to which are to be added Stuartia pentagyna, S. Virginica, Ilex mollis, I. longipes, Robinia hispida, var. Elliottii, Andromeda ligustrina, Vaccinium virgatum, V. vacillans, V. arboreum and a host of Hawthorns, Cratægus spathula, C. coccinea, var. mollis, C. Crus-galli. The rare Darbeyia umbellulata is endemic in this lower mountain region of Alabama, Georgia and North Carolina, and it is only from the station recently discovered in the latter state that pistillate plants have become known.

The crescent-shaped cavities, worn by the action of running water in the perpendicular walls of sandstone enclosing the deep gorges and narrow valleys so frequently intersecting the table-lands, give shelter to the most delicate and rarest of Ferns; Trichomanes radicans covers with its rooting-stems the walls of these gloomy recesses, called rock-houses, dripping with moisture, never reached by a direct ray of the sun, protected against sudden changes of temperature and aerial currents. The tiny T. Petersii, forming dense mats resembling in its habit a Liverwort, is found solely in their darkest and most hidden recesses. On the threshold rocks to these caverns Heuchera Rugelii is chiefly found; and on the exposed sandstone rocks Silene rotundifolia, S. Pennsylvanica and a variety of Ferns, such as Cheilanthes Alabamensis, C. tomentosa, Asplenium parvulum and A. pinnatifidum. Fully twenty-five per cent. of the plants so far observed in this lower mountain region are very rarely, if ever, found north of latitude 36° 30′, the line that separates the northern and the southern flora of eastern North America.

On the lower flanks of the mountains, where the outcrops of the mountain limestone form rocky declivities, and upon the calcareous lower hills the aspect of the flora is totally changed. The Red Cedar replaces the Pine among the deciduous trees, and in the most rugged localites occupies the ground exclusively, its dark foliage denoting in sharp outlines its presence at a distance. North of the Tennessee River in the openings of the dense Cedar-glades the surface of the flat rocks in the early days of spring is covered with the Draba Caroliniana, D. brachycarpa, Leavenworthia Michauxii, Claytonia Virginica, Arenaria petula, A. serpyllifolia, Bellis perennis, Ranunculus fascicularis, while the more open woods and copses of the hillsides, with a more varied tree-growth, present an array of herbs and annual plants rich in the varied hues of their flowers, such as Sedum pulchellum, Cynoglossum Virginicum, Lithospermum tuberosum, L. canescens, Phacelia bipinnatifida, P. fimbriata, Salvia urticifolia, Scutellaria versicolor, var. mollis, S. serrata, Monarda fistulosa, var. mollis, M. Bradburiana and Opuntia Rafinesquii, followed by the golden-flowered Hypericum (H. aureum) and H. cistifolium. Among the shrubs characteristic of the flora of these calcareous ridges are Forestiera ligustrina, Rhus Canadensis, and Symphoricarpus vulgaris, while among the trees confined in Alabama to the ranges of the mountain limestone among the outliers of the Cumberland Mountains are Cotinus Americanus, Æsculus glabra and Fraxinus quadrangulata. Fraxinus Americana, var. microcarpa, found to extend to the cretaceous hills in the centre of the state, occurs here with its fruit-bearing perfect seeds. This pretty tree, not exceeding twenty-five feet in height, with its widespreading limbs and drooping branches, can, therefore, not be regarded as a hybrid, and by the constant character of its fruit appears to be a proper species. As such it has been recognized first by Vasey, who, in his catalogue of the forest-trees of the United States, mentioned this tree under the name of Fraxinus Curtisii. Cotinus Americanus has been found on the summit of one of the highest limestone ridges near Gurley to cover tracts of several acres in extent, and there seems no doubt that this beautiful tree is found in such situations upon many of these detached spurs of the Cumberland Mountains in Alabama.

The three great functions of mountains—those of giving motion and change to water, air and earth—are indispensable to human existence. And thus those desolate and threatening ranges of dark mountain, which in nearly all ages of the world men have looked upon with aversion or with terror, are sources of life and happiness far fuller and more beneficent than all the bright fruitfulness of the plain. The valleys only feed; the mountains feed and guard and strengthen us.—*Ruskin.*

Plant Notes.

Aristolochia Sipho.

IN the illustration on this page is shown a fine example of the well-known Dutchman's Pipe, Aristolochia Sipho, as the broad leaves are seen relieved against the mat of Japanese Ampelopsis close against the walls of the house. The plant is striking here, but its luxuriant growth shows that it can be used to even better purpose where a covering is needed for a trellis or wall or wherever else a good thick screen is a desideratum. Although well known, the Dutchman's Pipe is much less frequently seen in gardens than would generally be supposed.

An inhabitant of the Allegheny region so rich in trees and shrubs, from Pennsylvania southward, it proves perfectly hardy in most parts of New England and will thrive even as far north as Montreal. In fact, the St. Lawrence Valley is much more favorable to plants of doubtful hardiness than many other regions farther south.

Aristolochia Sipho grows and thrives best in a deep, rich soil, and in most situations requires no protection in winter. As it is a twiner, and not a climber like Ivy, it will not grow up a blank wall without poles, wires or some other such objects, about and among which the stems may twine. The stems are very pliant and tough and may be freely handled or trained in any direction without fear of breaking. The very thick, large, roundish heart-shaped leaves are often a foot in length and eight inches wide, and when in full foliage the plant forms one of the most perfect and dense screens which can be grown on a trellis. This dense leafage pretty effectually conceals the curious brown-colored flowers, an inch and a half long, and of a shape resembling a siphon, or Dutch pipe, from which likeness the plant derives its specific and popular names. As the Aristolochias are without petals, the curious flower-tube is simply the calyx. The fruit is a six-angled, oblong capsule, two or three inches in length, and it is said that the seed does not long retain its vitality. Fruit seems to be uncommon or rarely produced in northern gardens. Where fresh seed is not available the Dutchman's Pipe may be propagated by layering or by cuttings in sand, under glass and with some bottom-heat.

We have many other vines, suitable for coverings or screens, whose foliage is more pleasing and graceful than this, which is somewhat coarse in appearance, but there is a solidity about it which makes it peculiarly appropriate in some situations. It seems to be very little affected by fungous or insect diseases.

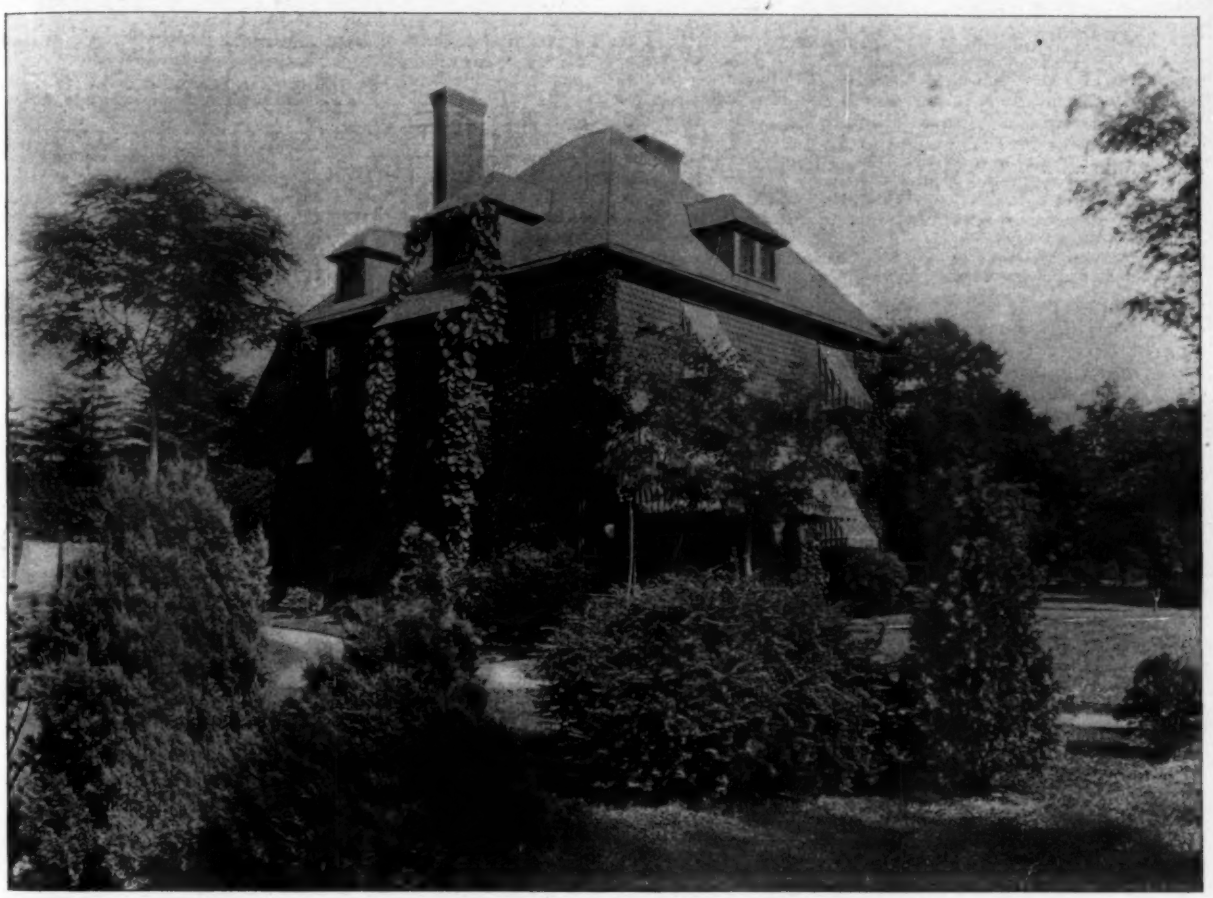

Fig. 86.—Aristolochia Sipho on the house of Mr. S B. Parsons, Flushing, Long Island.

Aristolochia tomentosa is another hardy species, with much the same habit as A. Sipho, but it is a much more slender plant, with lighter-colored and very much smaller leaves and smaller flowers of a brownish or greenish yellow color, with a deep purplish colored tube. The Dutchman's Pipe appears to be little, if at all, used medicinally as is the Virginia Snake-root (A. serpentaria) and others of the same genus, both in this country and the Old World.

The greatest number and the finest representatives of the genus are inhabitants of the tropics, and chiefly of tropical America. Figures of one of these were given in the third volume of Garden and Forest (pp. 598 and 599)

under the name of Aristolochia grandiflora, or Pelican Flower, which Mr. Watson of Kew afterward (vol. iv., 546) stated should be known under a different specific name, or A. Gigas. Large specimens of these blossoms, in cultivation, have measured eighteen by twenty-two inches across the face of the open flower, and, moreover, they are provided with a curious tail-like appendage three feet long. The forms of the flowers of these exotic species are quite as strange as in our Dutchman's Pipe, those of A. Gigas resembling a pelican or duck, especially when in bud. They seem to be constructed so as to entrap insects, and many of them give out a very strong and disagreeable odor.

We ought to add that our illustration is a view of the house of Mr. S. B. Parsons, of Flushing, Long Island, and that on another part of his grounds the Aristolochia which shows so well in this picture is used with great success to form such a screen as we have spoken of. In the pretty composition in this picture the tree at the left corner of the house is a thrifty young Kentucky Coffee-tree, which illustrates well the open character of its foliage at this stage of growth. The two plants in the foreground of the extreme left are a Japanese Juniper and a golden-tipped Arbor Vitæ. The compactly grown shrub in the centre is a good specimen of Berberis Thunbergii, and the plant at its right is a pyramidal Arbor Vitæ.

Yun-nan Rhododendrons.

THE current number of *The Garden* contains an admirable illustration of Rhododendron racemosum, which is a charming little plant, and since it is likely to be quite hardy in England, it will be a first-rate plant for the rock-garden. It is not more than nine inches high, with healthy bright green leaves an inch long clothing the entire stems. The flowers are terminal axillary clusters nearly an inch across, pale pink, margined with rose, and slightly fragrant. The plants in cultivation all came from the same batch of seeds, which were sent to Paris from Yun-nan by the French missionary Delavay. There is some doubt as to the correct name of this plant, but, whatever it may be, the plant is a welcome addition to our garden treasures. In fact, it seems that the Yun-nan Rhododendron may prove quite as useful in the garden as the Himalayan and Malayan species. Altogether there are some sixty-five species of Rhododendrons in China so far as is known, including such old species as Rhododendron Fortunei, R. Dauricum, R. ovatum and the so-called Indian Azalea. These Chinese Rhododendrons are not so magnificent as the giants of the Himalayas, but they have a charm of habit, flower and color which is their own.

New or Little-known Plants.

Cypripedium Warnero-superbiens.

THE new hybrid Cypripedium illustrated on page 511 was described in the *Gardeners' Chronicle* for September 10, 1892, by Mr. Robert M. Grey, gardener to Mr. H. Graves, Orange, New Jersey, in whose collection it has recently bloomed. This Orchid, C. Warnero-superbiens, was said to be intermediate between its parents, with foliage five inches long, acute, broad near the base, reticulated with dark green on a pale ground. The flowers are solitary, on pubescent brown scapes, the dorsal sepal proportionately large, white with radiating green nerves and a stain of vinous red across the centre. The inferior sepal is much smaller and of the same color. The petals are narrow, white, tinted with vinous red at the apices and closely veined with green, ciliate and warted on the margins, with an occasional spot on the surface, and some brown specks near the base. The lip is of a rich glossy brown color, slightly concave below the opening and speckled on the unfolded lobes. The staminode is pale green, with darker green reticulation.

New Orchids.

Odontoglossum Owenianum, Rolfe.—A distinct and pretty Odontoglossum which flowered in the collection of Messrs. F. Sander & Co., of St. Albans. The sepals and petals are yellowish white, the former with the whole of the disk chocolate, and the latter with or without a chocolate blotch. The lip, which approaches that of O. Pescatorei in shape, is wholly white. It may be a natural hybrid. *Gardeners' Chronicle*, August 13th, p. 178.

Zygopetalum graminifolium, Rolfe.—An elegant little species allied to Z. maxillare, Lindl., with narrow leaves and an erect raceme of largish flowers. The sepals and petals are light green, heavily blotched with dark brown, and the lip of a uniform bright purple-blue. It is a native of South Brazil and was imported by Messrs. F. Sander & Co., with Lomaria Boryana, on the trunks of which it creeps by its slender rhizomes.—*Gardeners' Chronicle*, August 13th, p. 179; *Lindenia*, t. 339.

Lælia × Owenіana, Hort.—A very pretty hybrid raised from Lælia pumila Dayana crossed with the pollen of L. xanthina. The sepals and petals are white, the tube of the lip bright yellow, and the limb dark maroon with a white tip. It was exhibited by Messrs. F. Sander & Co., of St. Albans, at a meeting of the Royal Horticultural Society on August 9th last, and received an award of merit.—*Gardeners' Chronicle*, August 13th, p. 191.

Lælio-Cattleya × Ingramii, Hort.—A fine hybrid raised from Lælia pumila, var. Dayana, crossed with the pollen of Cattleya Dowiana. The sepals and petals are light rose, and the lip dark purplish crimson with an obscure lighter tracing. It was exhibited by C. Ingram, Esq., of Godalming, at a meeting of the Royal Horticultural Society on August 9th last, and was awarded a first-class certificate.—*Gardeners' Chronicle*, August 13th, p. 191.

Vanda vitellina, Kranzlin.—A species allied to V. cœrulescens, Griff., but with yellow flowers of far smaller size. It was imported by Messrs. Seeger & Tropp, of East Dulwich, and flowered in the Royal Botanic Garden, Berlin.—*Gardeners' Chronicle*, August 20th, p. 206.

Cattleya × "Baroness Schröder."—A hybrid raised between C. Trianæ and C. dolosa in the collection of Baron Schröder, of The Dell, Egham. The sepals and petals are veined and tinged with clear rose-pink, and the lip white with rose-colored margin and an orange throat. It was exhibited at a meeting of the Royal Horticultural Society on August 23d last, and was awarded a first-class certificate.—*Gardeners' Chronicle*, August 27th, p. 249.

Eulophiolla Elisabethæ, L. Lind. & Rolfe.—A very interesting and handsome new genus, with something of the habit of Catasetum. It has an arching raceme of largish white flowers, with some maroon-purple on the back of the sepals and a deep yellow disk to the lip. The pedicels and the entire scape are of a deep lurid vinous-purple. It was introduced by Messrs. Linden, L'Horticulture Internationale, Brussels, and flowered in their establishment.—*Lindenia*, t. 325.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

London Letter.

Prunus Jacquemontii.—This is an interesting species of Plum, the introduction of which we owe to Dr. Aitchison, who sent seeds of it from Afghanistan to Kew, where it flowered in May, 1887, and was figured in the *Botanical Magazine*. It has fruited freely this year, and is now a conspicuous ornament in the Arboretum, the rich crimson fruits, as large as those of the Cherry Plum (P. myrobalana), being abundant on the twiggy spineless branches, upon which the brown tinted ovate leaves still remain. The fruits are in appearance as tempting as cherries, but their taste is not agreeable, being acid and astringent. The plant is, however, worth growing to look at. According to Hooker, it is the plant referred to by Brandis in his *Forest Flora*,

p. 194, under P. humilis, and described as a small glabrous shrub, with brownish gray bark, ovate-lanceolate, coriaceous, deep and sharply serrated leaves, fimbriate and often bifid stipules. It is found in the drier region of the north-west Himalaya, at an altitude of 9,000 to 12,000 feet. P. Jacquemontii fruits freely when small, plants less than a yard high being heavily laden with fruit, and it is quite hardy; it might be worth crossing with some of the garden plums, which would be improved in flavor by the addition of a little acidity. The stone of the fruit is small, nearly globose, and almost smooth.

Punica granatum, var. nanum.—This is a charming little shrub, which, in England, is much superior to the type, as it flowers freely, whereas the latter does not. In some German towns the dwarf Pomegranate is a favorite decorative plant, being grown and used as Solanum capsicastrum is here. At Kew it is planted outside in a sunny border, where it grows to about one and a half feet in height, and now, in October, it is covered with beautiful scarlet fleshy flowers. Lifted and planted in pots these little shrubs are most useful for the conservatory. The flowers are double.

Kniphofia modesta.—This is a white-flowered species, which was named and described by Mr. J. G. Baker, in the *Journal of Botany*, 1889, p. 43, and of which plants and seeds have this year been sent to Kew from Natal. It is a pretty plant, with linear keeled leaves a yard long, glaucous green, smooth-edged and soft in texture. The peduncle is slender, erect, three feet high, the upper foot a dense raceme of white flowers half an inch long; the tube is constricted at the base, then widening upward, and divided at the top into six regular segments; filaments a little longer than the tube, anthers yellow. This plant is a native of Griqualand, east, at an altitude of 6,000 feet. It may prove to be quite hardy in England. It is pretty when grown in pots in a greenhouse, and thrives in a sunny border in the open air, where, as well as in the Cape-house, it is now in flower. It is sure to receive the attention of those specially interested in Kniphofias.

Gerbera Jamesoni is still flowering in a sunny border in the open. The flowers, though a less brilliant scarlet, are quite as large as those produced in midsummer. Several years are necessary for this really beautiful Cape Composite to become established, but it is quite worth waiting for.

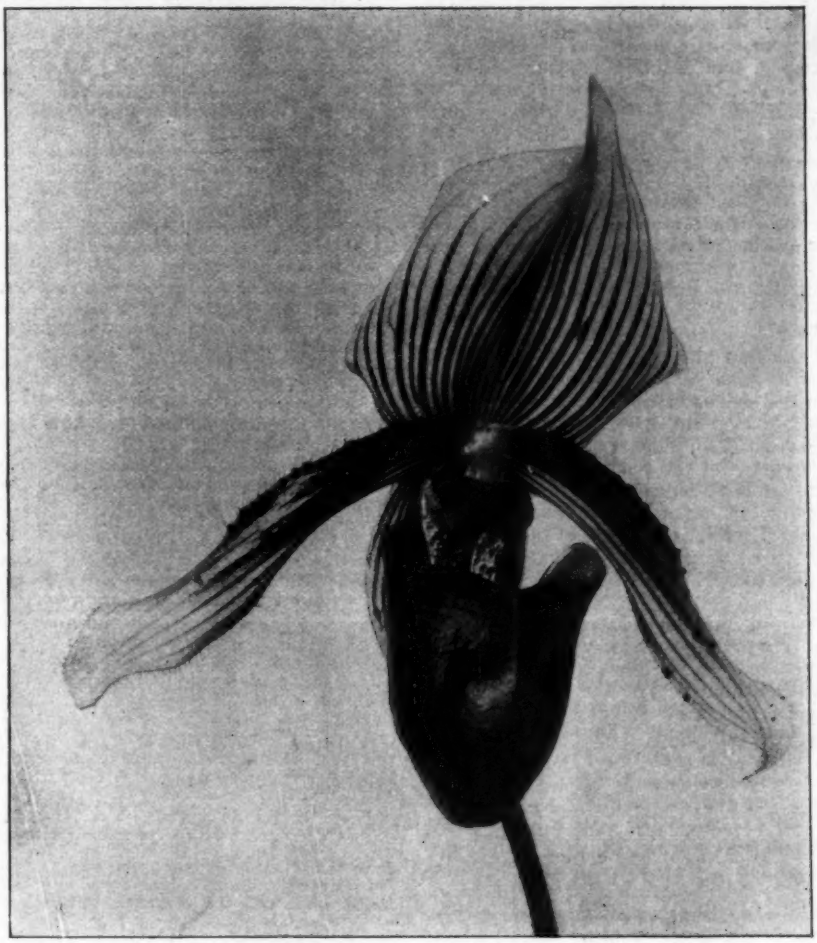

Fig. 87.—Cypripedium Warneri-superbiens.—See page 510.

The handsome green leaves and stout blooms produced by vigorous plants are much superior to those on a weak plant. In a sheltered sunny corner plants of it have now stood outside, winter and summer, for three years without suffering any apparent injury from cold. I consider G. Jamesoni one of the very best of the newer introductions from South Africa. Unfortunately, it has so far failed to ripen seeds here, and, as it grows slowly, division of the root-stock is not a quick means of working up a stock. Nevertheless, it is a plant worth looking after. Each flower is two and a half inches across, colored the most brilliant scarlet, and it lasts at least a month.

Nymphæa Mexicana.—We have several times had tubers of this plant from American correspondents, but in each

case they have turned out to be N. gracilis, a white-flowered species not unlike the white N. stellata, which was distributed a year or two ago as N. Voalefoka. A tuber of the true yellow-flowered N. Mexicana sent to Kew would be most acceptable, and, if the sender desires, the gift would be reciprocated. The Floridan N. flava has been in cultivation at least ten years here, but it flowers only rarely. I am told that N. Mexicana is much freer in bloom, and also a darker yellow, than N. flava. The seeds of these plants retain their vitality several years if kept quite dry in a packet. Some growers I know keep them in water in bottles, but the effect of this is to make all germinate within the year.

Eucharis Stevensil.—This plant is supposed to have originated from E. candida crossed with E. Sanderi, but, judging by a plant of it now in flower at Kew, it scarcely differs from E. Sanderi, of which a figure will be found in the *Botanical Magazine*, t. 6676. I am inclined to believe that nearly all these so-called species of Eucharis are merely seedling forms of one variable species. If any one will take the trouble to raise E. grandiflora (Amazonica) from seeds he will probably get plenty of variations quite as pronounced as those shown by such questionable species as E. Sanderi, E. Mastersii, E. Bakeriana and E. candida. There is only one really first-rate Eucharis, and that is the common E. grandiflora; the rest may be called more or less inferior varieties. It is remarkable that the habitat of typical E. grandiflora has never been found since it was first discovered by Triana, who sent to Linden in 1854 the bulbs from which all the thousands now cultivated have sprung.

The Belladonna Lily.—I have more than once written of this plant as one of the first attractions in the borders at Kew and a few other English gardens in autumn. There are now several hundred spikes of flowers on a south border against the Orchid-house here, where they make a rich glow of rose-red color. I write now to recommend growers of bulbs in America to take up the Belladonna and raise it from seeds. Hitherto we have relied solely on bulb offsets for the multiplication of this plant, consequently we have not improved it at all. That it is capable of considerable improvement by means of seeds and selection is evident from a plant, a seedling, flowering at Kew now. This plant was obtained several years ago as a probable hybrid between the Belladonna and Brunsvigia Josephinæ. On flowering, however, it proves that the supposed cross did not take place, the plant being unquestionably a pure Belladonna. But such a Belladonna! The scape is as thick as a man's thumb, a yard high, and it bears an umbel of twelve flowers all open together, half as large again as the ordinary form, and colored a rich rose-red, very nearly crimson. Every one who has seen this plant declares it the finest Belladonna Lily ever seen. We propose to call it variety Kewense. This Amaryllis, which, by the way, I may observe, is the only true Amaryllis, has been in cultivation since 1712, when it was introduced from South Africa.

We do not employ the seeds of bulbous plants for purposes of propagation nearly as much as we might. Cultivation, in a garden sense, generally has the effect of improving plants, but it is only when the plants are raised generation after generation from seeds that the law of variation is called into action. Branch or bud sports are extremely few and rarely occur, but seedlings often show a great deviation from the parent.

London. *W. Watson.*

Cultural Department.

A Few Neglected Grapes.

In our ambition for new sorts and improvements we are apt to overlook some of the best of our old fruits. This is especially true of Grapes. Among white Grapes I doubt if we have yet one which, altogether, is more worthy of a place of honor than Martha. It grows well, and when dead-ripe is sweet and refreshing. It has no hard pulp, and is not oversupplied with seeds. The berries stand out well shouldered, and get to be a fine translucent greenish white. In quality it is far ahead of Niagara, and in ripening much more reliable than Diamond. Nor is it inclined to any disease. For three or four years Martha has grown in favor with me.

Hayes is a richer grape than Martha and two weeks earlier, but it is not a good grower nor an abundant bearer. I think it decidedly the highest-flavored of our white grapes that I have tested for vineyard culture. In this respect it has but two rivals, Eldorado and Lady, neither of which gives good crops, as a rule. Lady is earlier, and, if a good cropper, should be rated as the most remarkable of all our grapes for quality and earliness. Eldorado is later, and of very fine quality; Hayes intermediate. But from the first translucency Hayes is sweet enough to eat, which cannot be said of most grapes, especially of Diamond.

A third grape liable to be crowded out is Duchess. This is a pure, sparkling, crisp grape, never sugary, but rich and very satisfying. My children select the Duchess from forty varieties. A disadvantage of this grape is that you cannot easily tell when it is ripe, and if left on the vines when ripened cracks and decays. It is not a good market grape, while very desirable for home use. There is no more prolific Grape; it bears huge bunches as handsome as hot-house varieties. The bunch is very compact, and is very rarely touched with rot.

Brighton should hardly be noted as likely to be crowded out, for in some quarters it is getting new attention. But there is for the vineyard, in my judgment, not one finer Grape than Brighton. The bunches are very large and handsome, just compact enough, and of most delicious quality. When planted alone it is a barren vine; when alternated with Niagara, Pocklington, Worden or Duchess it bears marvelously. It is capable of wonderful crops. The grape is, however, not a good keeper. Its parent (Iona) is, on the contrary, one of the best keepers. I shall steadily throw out a large number of varieties, replacing with Brighton.

Golden Pocklington is another worthy Grape that has been crowded too hard by Niagara, and deserves to be replaced in a selected list. It is a large grape of good quality, decidedly better than Niagara. If closely pruned it ripens about the same time as the Concord. Its tendency is to bear very heavily, with fine compact bunches; it has little inclination to any sort of disease.

A Grape rarely mentioned is August Giant; it is huge and of enormously rampant growth. The vine is very healthy and very hardy, and will cover a barn in five years. The bunches resemble Herbert, and the flavor is excellent. The skin is thick, and the grape is a good keeper. I have seen some tendency to mildew in shady places, but not much. I should class it with Herbert, although it is far from being as good as that magnificent fruit. Herbert is not a perfect self-pollinizer, but does fairly well. I plant Duchess with it. The flavor is pure, and there is no sour core. The skin is very thick; it is a good keeper.

One more overlooked Grape is Goethe (Rogers No. 1). It deserves to rank number one for all reasons. No other Rogers hybrid surpasses it, if any equals it. As far north as this it cannot be grown in vineyards; but a few degrees to the south the Goethe is the most delicious of the meaty varieties, as Iona is of the juicy sorts.

Clinton, N. Y. *E. P. Powell.*

The Vegetable-garden.

Our first sowing of the rose-colored Chinese winter Radish is now in use (October 15th), and our last sowing of seed of the same was made to-day. This sowing will be in use the greater part of the winter. Those who are fond of radishes should always use this variety in autumn. To many people it is better than most summer sorts. Those who have never used Radish-tops as a salad or as boiled "greens," should know that in a young state the thinnings of the crop make an admirable salad, cut up root and top together, while the more matured tops boiled with a bit of bacon are relished by any who are fond of "greens." One great advantage is the short time required to get a crop of greens for the table. Kale and Spinach, sown at the same time with these fall Radishes, will not furnish leaves for boiling for some time to come, and in the mean time the Radish-tops are useful, and, to my taste, much better than any kale. In northern localities these winter radishes should be lifted and stored before hard freezing sets in. Here the best plan is to mulch them with straw or pine-leaves to protect the soil from freezing, and they can be pulled as needed.

We were quite pleased with our little experiment with the English Broad Bean as an early green vegetable. Our seed was planted in a sunny situation in January. They soon came

up and grew with the utmost indifference to the weather. In fact, they were subject to quite hard freezing when in bloom without injury, and the green beans were ready for shelling before the early peas. Some folks laughed at the idea of eating "horse-beans," but I found them quite palatable while green. They soon succumbed to warm weather. The Italians here use them largely, planting in December. We would advise a trial of these, planted at the usual time for planting English Peas in the north.

The time for storing cabbage for winter in the colder sections is near at hand. Some like to keep the stalks over for sprouting spring greens. For this purpose heel the cabbages in a furrow and pack the earth well around the base of the head. Pack the rows closely together so as to make compact beds five or six feet wide. Then thatch them over closely and thickly with evergreen boughs, and they will usually winter well. When no account is taken of the stalks, plow out a deep furrow in a dry place and place the cabbage in it root upward and the leaves of the head well tucked under. Then plow furrows from each side, and finish with a sharp and smoothly patted ridge over the row. This I consider the best method in any locality where a zero temperature occurs. Here the most expeditious way is to turn each cabbage on its side without pulling it up. Turn the head toward the north, and then cover the stem and base of head with earth. This should be done just after Christmas.

On the approach of winter, if your vegetable-garden soil is of a clayey character, you will find your spring work greatly facilitated, and the soil in much better condition all the next summer, if it is thrown into sharp narrow ridges with a plow, and left thus all winter for the frost to act upon it. These ridges will get very mellow, and will dry out earlier in spring than a flat surface, and they can be worked down and planted a week or two sooner than the land of your neighbors who do not take this precaution. It is easy enough to beat folks northward of you in earliness of products, but the skill of the gardener is best shown by the foresight which enables him to get in advance of his immediate neighbors.

We have now (October 17th) green peas in great plenty from a sowing of Premium Gems in August. There has been but one good rain since they were planted, and yet the vines are fresh and green and clear of any signs of mildew. Yorkshire Hero is just in full bloom, and may do better than the Gems if we have rain soon and frost does not put in an appearance too heavily. The Premium Gem and other early Peas can be relied upon for a fall crop almost anywhere north if sown in August. Ours would have been over long ago if the weather had been favorable. To my surprise I have never seen here any signs of mildew on fall-sown Peas, while in Maryland it gave us some trouble every fall. We sow these fall Peas in a deep furrow, cover lightly, and work the soil in level as they grow.

We have just sown one crop of Onions, chiefly the Italian varieties. They are sown very thickly on ridges slightly elevated above the surface. These will be transplanted early in February. Northward this sowing may still be done in cold frames, and the transplanting done in March and April. Onion-seed sown here last February in the open ground produced a fine crop, but we think the fall-sowing will give a larger one.

Raleigh, N. C. *W. F. Massey.*

The Crown-bud of Chrysanthemums.

THE proper selection of the crown-bud is of vast importance to all who grow Chrysanthemums for specimen blooms. There is a great deal of doubt, especially among amateurs, regarding its identity. There are, however, certain well-marked characteristics, which, when once recognized, can hardly be mistaken. Although many of our finest blooms are the result of a crown-bud, it is yet an abortion at best, and if left to nature would seldom, if ever, develop. It always appears singly as a terminus to the stem, subtended by two or more lanceolate bracts. In the axils of the leaves, immediately below it, are two or three prominent shoot (never flower) buds, which commence to grow at once. If the bud is not desired, and it sometimes appears in May, as in W. H. Lincoln and Viviand Morel, one of the shoot-buds is allowed to grow, and in a little while the crown dwindles away. The majority of Chrysanthemums show their first crowns from the middle of July to the end of August. According to the experience of several large growers, whom I have visited lately, it is safer to discard all buds which appear before the 5th of August. A good percentage of these will produce what is known as the "second crown" by early September—say between the first and twelfth. A good terminal bud—the last bud to form, and which, by the way, is always subtended by other flower-buds, often arranged in a cluster—is better than a poor first crown-bud, and generally develops, if not so large, a better-finished flower. Experience alone will show which to take, and it would be well to watch all new varieties in this respect, as well as to note the height they attain on any particular bud. I recently noticed a very even lot of the superb new white variety, Mrs. E. D. Adams, on first crowns, and Rohallion and V. H. Halleck may also be mentioned as being remarkably good. Domination is best on a second crown, while Miss Annie Manda and G. W. Childs are better on either second crown or terminal than on the first. Viviand Morel shows well-formed heads on second crown-buds, but produces flowers of better color and finish on terminal buds. A long list might be made with reference to the value of the different buds, which would be of great service another season.

There is much difference of opinion as to the best time to plant Chrysanthemums. For exhibition blooms all agree that early planting, say by the 15th of June, is best. This gives a longer season of growth and fits the plant to carry a larger bloom. The main objection to early planting is the liability to show crowns too early, say by the end of July, which must be discarded. This means two or more feet of additional height, an inconvenience where head-room is scarce.

There is no doubt that, for commercial purposes, late planting, from July 12th to 20th, is best. Very few of the ordinary first crowns will appear, the buds being about equally divided between second crowns and terminals.

The Chrysanthemum has not reached the zenith of its fame. Its popularity is great, and while it is increasing it is pleasing to notice there is no confusion. Every year growers become more and more critical, and do not hesitate to throw away a variety, no matter how good it may have been, when it is superseded. Although size has hitherto been the aim, refinement is now demanded, and this we see in many of the recent introductions. It is yet too early to speak of all, but in my opinion Mr. John Thorpe's G. W. Childs is the best novelty of 1892. Mr. Hicks Arnold and Mrs. E. D. Adams are flowers of great refinement and beauty, and will be sure to stay. Miss Annie Manda will surely displace Mrs. Alpheus Hardy, at least for commercial purposes, as it grows more freely and is certain to give a good percentage of marketable blooms.

Wellesley, Mass. *T. D. H.*

Begonia gracilis.

BEGONIA BICOLOR is the latest addition to the varieties of this interesting and beautiful species, and seems to have been first offered by V. Lemoine & Sons in the autumn of 1891. At present flowering, the plant is very distinct. The leaves are thick and of firm substance, with numerous fine channelings. The color is a dull green with dull white spots, and silvery on the reverse. The stems are thick and succulent. The flowers are, as usual in the type, borne on short axillary peduncles, and are pink and four-petaled. As yet the variety has not sent out any of the thin graceful shoots which, when filled with flowers, help to render the other varieties so attractive. B. gracilis is a Mexican species, and I believe the varieties are also natives of that republic. It is usually grown under the name of B. Martiana. Mr. C. C. Pringle, in a note in GARDEN AND FOREST, vol. i., p. 7, notes that it grows in a region where the earth freezes and snows fall, and it should be quite hardy. The tubers are round, or sometimes elongated, with smooth white skins. The stems are succulent, and the main one eighteen inches to two feet high. Strong bulbs also throw several shorter ones in addition and numerous axillary ones. The flowers are male and female, rosy pink, and borne on short peduncles. The short branches noted above make very beautiful sprays for cutting, though the species is most useful for the summer decoration of the greenhouse.

Begonias are plants which are readily and rapidly propagated, as a rule, and nature has endowed B. gracilis with a full measure of means for its perpetuation. The bulbs when dormant seem to be indifferent to either dryness or moisture and throw off offsets. This plant is an abundant seed-bearer; the stems will strike root, and in the axils of the leaves a plant will bear hundreds of bulblets like mustard-seed, which may be used as seed. Such a plant has many chances for life under the most discouraging environment. The young plants which spring up in the earth on the greenhouse-benches seem usually true to the type, but I have a plant with an elongated bulb bearing flowers which are all female and much darker than the type, and evidently an hybrid.

Begonia grandiflora is evidently a selection with larger flowers. B. diversifolia is a smaller-growing kind, with darker

leaves and more numerously branched. B. racemiflora is a variety very much like B. diversifolia, and, as grown by me, I do not understand the reason for its distinctive name, the habit of flowering not being different from that of the type. Under the name of B. Martiana pulcherrima, Messrs. Lemoine offer a variety, said to be a seedling of B. Martiana grandiflora, with large deep carmine flowers and red stems and purplish leaves. Messrs. Pitcher & Manda have a form with finely cut and silvery spotted leaves which seems to be still unnamed, and which has not yet been distributed. These plants require positions well up to the glass, or they become somewhat drawn. The culture is the same as that of other summer-flowering tuberous-rooted Begonias.

Elizabeth, N. J. *J. N. Gerard.*

The Ornamental Value of Sedges.

I HAVE long thought that Sedges or Carices will some day be considered valuable ornamental plants, and I have begun their cultivation for that purpose. I have just seen an excellent example of their value in the unique botanic garden at the Michigan Agricultural College, where Mr. C. F. Wheeler, who is a most ardent lover of wild plants, and of Sedges in particular, has collected many of our native species. Two distinct types of decorative value are to be seen in these Sedges, one being the free and unique character of clumps shown in the tall-growing and large-spiked forms, the other being the compact and bunchy habit of leafy-based species, which are suitable for use in borders. Among the tall species, Mr. Wheeler regards the common Carex crinita as one of the best. It grows readily in any low or moist place, as do most of the species, and its tall spreading culms and swinging spikes form a striking object. Other species of similar habit are C. monile, C. utriculata, C. lurida and C. Tuckermani, all of which are common in many parts of the country.

Large clumps of any of the strong Carices are unique objects, if grown in a somewhat isolated position, so that the individuality of the species can be seen. Among those species which may be called border Carices, the low broad-leaved kinds are most useful, and these vary so widely in color and habit that excellent effects can be produced by them. Some of them possess a rich glaucous blue color which is very striking. One of the best of the blue ones, especially for sunny positions, is Carex granularis, and C. laxiculmis is also good. Other excellent native broad-leaved stooling species are C. plantaginea, C. laxiflora, var. latifolia, C. platyphylla and C. Careyana. All of these succeed in rich loamy soil, and although they usually reach their greatest perfection in half-shady places, it the soil is moist they do well in full sun.

Cornell University. *L. H. Bailey.*

Correspondence.

Some Remarkable Plants in San Diego.

To the Editor of GARDEN AND FOREST:

Sir,—The remotest south-western city in the United States has just been celebrating the three hundred and fiftieth anniversary of the discovery of California. Everybody and everything has been laid under contribution to make the best display, so that the celebration from every point of view was successful. Garden art is still young here, and yet horticulture contributed to the decoration of arches, streets and buildings most effectively. Palm-leaves were largely used, and beautiful flowers and choice plants ornamented many of the small gardens surrounding the houses. Among plants worthy of special notice was a Corypha Australis with a slender trunk and a huge crown of leaves more than thirty feet high. There were fine specimens of Seaforthia elegans twenty to twenty-five feet high, one of them in flower; Cocos Australis, in flower also, was most conspicuous for its glaucous foliage; fine fruiting plants of Erythea edulis, the Guadaloupe Palm, were observed, of which not much is known in the eastern states, and even less in Europe. This is one of the best fan-leaved Palms, and is sure to become a general favorite for its elegance of habit and boldness of foliage. A few specimens of Erythea armata, the Blue Palm, were seen. These, though twenty years old, were not very tall, growing more slowly even than Chamærops humilis. Besides these there were a numberless host of commoner Palms, such as Phœnix dactylifera, P. reclinata and P. Canariensis, Washingtonia filifera, Chamærops excelsa and C. humilis. These, including the Seaforthia, stand full exposure to the blazing sun without damage to their leaves, as happens so often in less hot countries. This is remarkable, and not easy to be accounted for; its cause must be sought in the telluric and climatic conditions of this privileged country, where one is surprised to see Poinsettias growing side by side with Hollies, and Yews with Apple-trees, German Medlars and Raspberries ripening their fruit next to Bananas, Pineapples and Cherimoyers.

Many interesting plants are to be seen at the far-famed Hotel del Coronado on the narrow peninsula encircling the beautiful bay of San Diego. The spacious court-yard, laid out as a garden not more than six years ago, contains two magnificent specimens of Cocos plumosa, thirty to thirty-five feet high; two Seaforthias of about twenty feet; a unique specimen of Kentia Forsteriana fully fifteen feet high; younger specimens of other Palms, flowering shrubs of many kinds, and a luxuriant growth of climbers, among them the large-flowered and large-leaved Aristolochia Bataviensis, Stephanotis floribunda, profusely blooming all the year round, but at its best in winter; Phaseolus Caracolla and Ipomœas and Bignonias in variety.

Los Angeles, Cal. *E. F. Franceschi.*

Apples Exempt from Scab.

To the Editor of GARDEN AND FOREST:

Sir,—While the blights from fungi have taken nearly every variety of old kinds in our orchards, we are glad to report that those which have a Russian origin are here almost entirely exempt. The thick-leaf characteristic of this class of fruits seems to resist the fungoid diseases, and, with the exception of Tetofski and Zusoff, have given a full crop of fruits. Duchess of Oldenburg, where it carried a heavy crop last year, gave but little fruit this year, but the foliage is very healthy and good. Alexander, an old Russian, gave a much better crop than usual. Red Astrakhan is all right. Red Wine gave us the finest crop we ever had, and they are the handsomest apples I ever saw in a collection of two hundred kinds. This is a new Russian, ripening in September. Longfield is probably the most profitable of the new Russians. In eighty varieties, this, on trees four years planted, literally trailed its branches on the ground with nice clean fruit, and the foliage is untarnished. Yellow Transparent is also a success, to which there are no objections unless the twig-blight shall injure it farther south; the leaf-blight does not seem to trouble this excellent summer Apple. Hibernal is another successful Russian, and I might mention fifty kinds that are successfully withstanding the leaf-blights and scab in this unfavorable year.

We have in Wisconsin a number of seedlings that are carrying their fruit and foliage this year, among these Wolf River, which we suppose is a seedling of Alexander, also McMahon, supposed to be of the same origin. This last is somewhat scabbed in fruit, but the foliage is but little injured. Avista is another promising seedling which has not failed a crop in twenty years. We are propagating Peerless, one of Minnesota's pets, and the foliage is as clean and healthy as that of Duchess of Oldenburg. Here at Janesville, the Duchess has brought to market as many bushels as the best ten varieties of our standard Apples, and it would not be extravagant to say more than all other kinds, but, with the present outlook, Longfield will pay better, tree for tree and acre for acre.

This season we found a tree of small white apples which bore two barrels, and was so free from scab, blights and attacks of insects that it attracted our attention, and we exhibited branches with their fruit at our state fair. This tree stands in a pasture where we did not spray at all either for insects or scab, and it may possibly be of value, although the fruit is no larger than Little Red Romanite; season October and November; very fine for cooking.

What I should like to urge upon the readers of your paper is to take notes of valuable seedlings and of any variety that pays this off year, and bring such to the notice of their state and local societies and help develop those kinds that are promising. We believe the seedling crosses of Russian Apples with our best native varieties will produce the paying crops of the near future. Patten's Greening and Iowa Beauty are very promising seedlings along this line; the foliage is perfect and the fruit very desirable.

Janesville, Wis. *George J. Kellogg.*

Why do Fruits Drop Prematurely?

To the Editor of GARDEN AND FOREST:

Sir,—Is it not possible that the dropping of the little fruits mentioned in Professor Bailey's article on Apple Scab, p. 490, may be partly caused by lack of efficient pollination due to rainy weather at blossoming-time, which interferes with the usual transfer of pollen from flower to flower by insects? In some dwarfed Apples which were examined last summer no

seeds were found, and in others the seeds were few or abortive, indicating lack of efficient pollination. I see no reason why the failure of Apple-fruit to develop may not result from lack of efficient pollination, as was shown to be the case with Grapes in the article on self-pollination, p. 451. It is well known that pollination from an uncongenial source, while not resulting in well-developed specimens of fruit, still may incite the growth of little fruits, which soon drop away or persist in an abortive or dwarfed condition. It may be true that the dropping of the little apples was not due to lack of efficient pollination, yet there are reasons why this may well be considered as one of possible causes. It was shown by M. B. Waite, in a paper presented at the Rochester meeting of the American Association for the Advancement of Science that certain varieties of Pear are incapable of fertilizing themselves. A few tentative experiments made by Dr. Halsted,* Professor D. G. Fairchild† and the writer indicate that excessive rainfall at blossoming-time may seriously interfere with the setting of fruit in the case of Apples and Pears, and, in a less degree, of Grapes. In many orchards last spring, however, the rainy weather did not prevent the trees from setting full of fruit, but in a short time most of it fell off. Some experiments of the writer in cross-fertilization and self-fertilization of the Apple lead him to suspect, as suggested by Mr. Waite and as proven to be the case with Grape and Pear, that certain varieties of this fruit also can fertilize their own blossoms only in an imperfect way.

Agricultural Experiment Station, Geneva, N. Y. *S. A. Beach.*

Warm Water for Tender Nymphæas.

To the Editor of Garden and Forest:

Sir,—I agree fully with Mr. James Brydon when he says "the best Nymphæas are grown in deep water," instead of a depth of six or eight inches as sometimes practiced. The most difficult problem to solve, however, is how best to heat the water to a depth of two to three feet below the surface. I have maintained for some years ponds for the cultivation of tender Water Lilies and Victoria Regia, using the ordinary system of hot-water heating by taking the supply to the heater from the bottom of the pond and returning heated water about eighteen inches below the surface at the opposite side of the pond. The plan is a fair one, if no better means can be devised, but the objection is that the hot water ascends to the surface immediately on being discharged and the temperature of the water one foot below the surface is generally very much below that at the surface.

Now I have a plan, new to me, that I propose to try next season. A large steam boiler used for power is within three hundred feet and it is proposed to take a steam pipe through a small brick conduit laid underground, the pipe being well covered with a good non-conducting material and then the bricks laid in cement to cover. Coils of one-inch galvanized iron pipe will be laid on the bottom of the pond, or rather the pipe will be laid round in increasing circles, and the condensed steam will be taken away by a pipe out of sight or it can be utilized to raise the water, or make up any leakage or evaporation. A large bulb of mercury is to be arranged so that by expansion or contraction the steam will be turned on or off. The pond is forty-two feet in diameter and three feet six inches deep, but it is confidently believed that by having the source of heat at the bottom in the form of hot steam pipes the problem will be solved. If any one who may read the views here expressed knows any reason why the plan is not a good one I should be pleased to hear it.

Northampton, Mass. *W. W. Lee.*

A Unique Chrysanthemum Show.

To the Editor of Garden and Forest:

Sir,—Los Angeles has, in the last six or seven years, won a reputation for flower-fêtes that can scarcely be excelled in magnitude or beauty anywhere in the country. In April of each year the Flower Festival Society, a band of philanthropic women, gives a fête which fills a large pavilion. Later, the professional and amateur gardeners of southern California have their annual exhibit, and for three years the Chrysanthemum has been exhibited on a large scale by the women of one of the churches.

The two Chrysanthemum exhibits previously made were in spacious halls. Last spring a plot of unoccupied ground adjoining the church was secured. This space, 140 by 165 feet, was placed in the care of a Japanese gardener, who laid it out in beds and winding walks, with reservations for a dozen booths, and planted it with over 10,000 choice Chrysanthemums. An immense cloth tent was placed over it, and here, during the fête, was a scene pronounced by many visitors to be the most beautiful they had ever beheld, even in this land of wonderful flower-shows.

Directly opposite the entrance a miniature mountain-range extended, its sides covered with verdure, and its cañons dotted with flowers, while on the summit pure white blossoms were massed. Passing around this sierra one came upon a tiny lake bearing rare aquatic plants upon its bosom. The pretty booths were entwined with climbers, mostly Sweet Peas in various colors and Smilax. The smooth broad walks, winding as in a maze, separated gorgeous beds of Chrysanthemums, some in shaded colors, others of a single hue. Nearly 300 varieties were represented in the garden. From the frame-work supporting the tent were suspended flags and streamers of all descriptions such as are used in Japan. The pillars were covered with a luxuriant growth of the Moonflower-vine in blossom, and the surrounding fence was concealed and transformed into a thing of beauty by clinging Morning-glories. At one side of the garden was a Japanese hut, made entirely of bamboo, and thatched with grasses in the style of that country. Outside its door were bamboo-tables holding tea-services in Japanese ware, and here a cup of the genuine oriental article, served with joss-sticks, could be had.

Besides the thousands of Chrysanthemums growing in the ground, the property of the ladies, there were many fine specimens in pots sent by florists in competition for the prizes offered. There were also about 2,000 Aster-plants, and many Dahlias, Cosmos and Carnations. All the plants belonging to the church were for sale at the close of the exhibition.

This show, without doubt the most extensive outdoor exhibit of Chrysanthemums ever made in this country, it is pleasant to know was a financial success as well as a means of pleasure and instruction for the public.

Los Angeles, Cal. *Clara S. Brown.*

Periodical Literature.

An interesting article in the October number of *The Atlantic* is Professor N. S. Shaler's "Betterment of our Highways." We may not fully endorse his opening remark that "Perhaps the best of the many measures which may be applied to modern states to determine the degree of advancement to which they have attained may be found in the condition of their common roads." For this naturally leads to his conclusion that, "judged by the standard of our local ways, America as a whole must be regarded as the least advanced of all the countries which are commonly classed as civilized." But Italy, for example, has better common roads than ours; yet if "advanced" is taken in any really general sense, few persons will assert that Italy is more advanced than the United States. Professor Shaler acknowledges, indeed, to a fact which has already often been pointed out—that the newly born railway was an extremely detrimental influence upon the extension of good common roads in this country. But we think he might have laid some emphasis upon this fact as mitigating our still-too-evident sins in the matter of common roads, and entitling us to consider ourselves more civilized than some other nations whose roads are better.

However, this is a minor point. For the most part what Professor Shaler says is so true, and has so long been true, that it is a disgrace as well as a wonder that any one should have to say it again to-day. But it must be said to-day and to-morrow and the day after to-morrow, by many voices as often as they have opportunity, if the public at large is to be awakened to a vivid realization of an evil which means an active concerted effort for its abolition. Therefore, Professor Shaler's article is very welcome as one of the clearest and best expositions of the subject that we yet have seen. He does not waste time in describing how bad most of our roads are; he devotes his attention chiefly to showing how they may be improved. His explanation of the extreme difficulty of good road-making—which means, not the persistent use of one consistent scheme, but the perpetual adaptation of sound fundamental ideas to very different local conditions—ought to show our legislators and our educators how necessary is thorough training in the art of road-making if good roads are to come in all parts of our country. Nothing could be more evidently true, yet nothing could more insistently need saying, than that "the first step toward our new dispensation is to persuade our greater schools to undertake the systematic education of road-

* "Influence of Rainfall at Blooming-time upon Subsequent Fruitfulness," p. 230, *Annual Report N. J. Exper. Station*, 1890.

† "The Effect of Rainfall upon Pollination." Paper presented before the last meeting of the American Horticultural Society by D. G. Fairchild and S. A. Beach.

masters, giving to the task the same care which they devote to the preparation of young men for railway or hydraulic engineering. . . . The Lawrence Scientific School of Harvard University has already arranged for the services of an instructor in this department, who will devote all his teaching to matters connected with road-construction. . . . If a dozen of our engineering schools in different parts of the country will provide similar systematic and continuous instruction, we may hope, in the course of four or five years, to graduate trained road-masters who are well informed in the science and art of their profession."

Notes.

The Prussian Academy of Sciences recently voted a grant of 2,000 marks to Professor P. Ascherson, to enable him to issue a new edition of Koch's *Synopsis floræ Germaniæ*.

It is reported from St. Petersburg that the beautiful gardens on the island of Fontanka, in the river Neva, were totally destroyed during a terrible storm which occurred on the night of September 23d, when the stream rose to a height of six feet above its normal level.

Among the special prizes at the Chrysanthemum Show, to be held next week in Madison Square Garden, New York, is the GARDEN AND FOREST Cup, valued at fifty dollars, and offered by the publishers of this paper for the best vase of cut Chrysanthemums containing six blooms of any one variety.

Of hybrid perpetual Roses, Mrs. John Laing was exhibited oftener this year at English exhibitions than any other variety, and it is only excelled by Madame Gabriel Luizet and La France in the number of times it has been staged during the last three years. Among the Tea and Noisette Roses, The Bride, which is a nearly white sport from Catharine Mermet and of American origin, was shown the oftenest—that is, forty-five times.

In the famous old gardens of Syon House the Lebanon Cedars are noted for the cleanness, the length and size of their trunks rather than for the great sweep of boughs. Trees with branches which spread 100 feet are not uncommon, however, nor are trunks rare which are fifteen feet in circumference. There are many striking specimens of Taxodium distichum in this garden over 100 feet in height and throwing up knees two or three feet high over a circuit 100 feet across on the turf.

Apart from its beautiful flowers, graceful form, the delicate texture of its bark and ample foliage during the summer, the Virgilia, or Yellow-wood (Cladrastus lutea), deserves to be noticed as taking rank among the most beautiful of our native trees for its autumn coloring. While the majority of trees whose dead leaves do not cling to the branches all the winter are entirely stripped, the Yellow-wood is still well clothed with foliage of a clear yellow which is especially bright when the sun shines on it.

On account of the graceful way in which its snowballs are tossed in the air, the old-fashioned Viburnum opulus is superior to the newer Japanese species V. plicatum. The foliage of the latter, however, is not nearly so liable to be crumpled up by insects, and it has the additional advantage that its foliage turns in autumn to a deep and rich color, which is altogether indescribable in words, but which has been called a crimson-bronze. The leaves, too, cling to the shrub very late, so that this rich coloring appears at a time when it is highly appreciated.

In the diary of the late Professor J. W. Bailey, some extracts from which were recently published in the *Bulletin of the Torrey Botanical Club*, it is related, on the authority of Dr. Torrey, that Professor Lindley's well-known *Outlines of the First Principles of Botany* was wholly written on journeys to and from his residence, about six miles from London. "When the stage stopped at an inn Lindley would write on a scrap of paper a sentence or two of the work, using his hat as a desk, and this was but one instance of the constant devotion and industry of the Professor."

The *Gardeners' Chronicle* quotes from one of the essays of Mr. William Paul, which have been lately collected into a volume, the following sentence: "It would be commercially unwise to attempt to raise Hyacinths against such skillful gardeners as the Dutch. We can buy and sell cheaper than we produce." To this the *Chronicle* adds the comment that, while it is true as a general statement, experience at Kew for two or three years tends in the opposite direction, and, indeed, it is a fact that bulbs have been cultivated successfully in the sand-hills of Sandwich. We may add, that experiments in this country show that more than one of the so-called Dutch bulbs can be grown with profit here.

Mr. Thomas Calhoun, of Wilson County, Tennessee, was one of a committee appointed in 1847 to select the grounds for a camp-meeting and the site for the audience-shed. He carried with him a Sycamore handspike, which he drove into the earth at the spot chosen for the pulpit. The shed was soon erected but the stake was not disturbed, and in time it put out shoots and leaves. Mr. Calhoun was about forty-five years old when he drove in the stake, and he is living yet to see it after it has developed into a tall Sycamore, twenty-two inches in diameter and as straight as a stove-pipe.

It is an unusual season when Cannas are blooming out-of-doors in the last days of October, and therefore it is not fair to expect that the earlier kinds of hardy Chrysanthemums will always do as well out-of-doors as they are doing now. At the same time there are few years when we have not many bright warm days in October, so that if hardy Chrysanthemums are covered up for a few bitter nights we may generally expect that they will give good bloom until November. Of course, exhibition blooms can never be grown out-of-doors, but with a proper selection of varieties we can have sheltered spots in our out-of-door gardens gay with the crimson and yellow and white of the hardy Pompons and Chinese varieties.

During the second week of October there could be seen in this city near the Worth Monument, on the Broadway side of the triangle which is encircled by Horse-chestnut trees, one specimen which had done its best to decorate in honor of Columbus. Like most of our city Horse-chestnuts, it had long been almost leafless, clothed only by a few gray and shrunken shreds of foliage. But before the other festivities began it threw out from the ends of several of its branches tufts of fresh bright light green leaves, and even some panicles of blossoms which, while not so large and full as those of its spring-time, had a very odd effect against the background of the sparse withered leaves. The fresh leaves and flowers together looked as if they had been tied to the trees instead of growing there in defiance of the seasons.

One of the most attractive objects in Ventura, California, according to the *The Unit*, which is published in that town, is a hedge of Heliotrope two hundred feet long, facing the street, and in the gardens of Mrs. Theodosia B. Shepherd. The walk is three feet below the garden-level, and on the banks above, wires stretched upon low posts support the plants, which now droop down to the walk and stand six feet above it covered with fragrant masses of flowers. The plants were set out five years ago, and all the year their beauty and perfume attract not only the birds and bees, but children passing by fill both hands, and gentlemen and ladies catch a spray for a boutonnière or a corsage-bouquet, for Mrs. Shepherd says the Heliotropes belong to the town. In the last week of September the branches were trimmed and the seed gathered. Three men were kept busy for two days cutting, raking, sweeping and sifting. The trimmings were carried away by the wagon-load, and twenty-five pounds of good, firm seed harvested, and yet, in a fortnight, the hedge will be prettier than ever. It requires trimming three or four times a year.

In speaking of plants which are in danger of extermination, M. V. Brandicourte, Librarian of the Linnæan Society of the North of France, writes in the *Journal of Horticulture* that one of the most graceful species of Eucalyptus, E. Alpina, formerly abundant in Mount William, in Australia, would now be unknown had not Baron von Mueller planted the specimen in the Botanical Garden at Melbourne. Psiadia rotundifolia, a tree belonging to the Compositæ, some twenty feet high, with heavy naked branches and small Aster-like flowers, was once abundant in St. Helena. Man and goats have played such havoc with the forests of that island that this species would be reduced to a single individual but for the fact that it has been cultivated at Kew. From the Department of Sonne, in France, some fifty species have already disappeared, or are tending to disappear, those most menaced being plants sought by amateurs or horticulturists on account of their gracefulness or the brightness of their flowers, and those which are taken by botanists, who sack everything that is rare. Foreign botanists have extirpated even the last living representative of the dwarf Palm (Chamærops humilis), which formerly grew in the vicinity of Nice, and an interesting Orchid, Spiranthes Romanzoviana, with a white and exquisitely fragrant flower, has apparently disappeared from the small meadow on the borders of Bantry Bay, in the south of Ireland, which was its only known station.